

IN THE CLAIMS

This listing of the claim will replace all prior versions and listings of claim in the present application.

Listing of Claims

1. (currently amended) A disk storage system comprising:
 - a first plurality of disk drives storing data;
 - a second plurality of disk drives storing data;
 - a first loop used to transfer data to the said first disk drives;
 - a second loop used to transfer data to the said second disk drives;
 - a first plurality of communicating lines ~~connecting the~~ coupling said first loop ~~and the~~ with said first disk drives and coupling said first loop with said second disk drives ~~second loop~~;
 - a second plurality of communicating lines ~~connecting the first loop and the~~ coupling said second loop with said first disk drives and coupling said second loop with said second disk drives;
 - a first plurality of connecting parts ~~connecting the~~ coupling said first communication lines and the said second communication lines with the said first disk drives;
 - a second plurality of connecting parts coupling said ~~connecting the first~~ communicating lines and the said second communicating lines with the said second disk drives;
 - a disk controller comprising:

a first disk communicating port ~~connected~~ coupled to the said first loop, and communicating with the said first disk drives via the said first loop,

a second disk communicating port coupled ~~connected~~ to the said second loop, and communicating with the said second disk drives via the said second loop,

a host communicating port communicating with a host unit,

a cache memory storing data, which is communicated ~~communicating~~ between the said host communication port and the said first and the ~~second~~ disk communicating ports, and

a processor controlling the said host communicating port, the said first disk communicating port, the said second disk communicating port and the said cache memory.

2. (original) A disk storage system according to claim 1, wherein each of the first plurality of connecting parts connecting each of the first and the second plurality of communicating lines with each of the first plurality of disk drives, and each of the second plurality of connecting parts connecting each of the first and the second plurality of communicating lines with each of the second plurality of disk drives.

3. (currently amended) A disk storage system according to claim 2, wherein each of the first plurality of communicating lines corresponding to the first plurality of disk drives are a normal communication route, and each of the second plurality of communicating lines corresponding to the first plurality of disk drives are

communication route in case of a failure of each of the first plurality of communicating lines.

4. (currently amended) A disk storage system according to claim 3, wherein each of the first plurality of communicating lines corresponding to the first plurality of disk drives are a normal communication route, and each of the second plurality of communicating lines corresponding to the first plurality of disk drives are communication route in case of a failure of the first loop.

5. (currently amended) A disk storage system according to claim 4, wherein communication is performed from each of the first plurality of communicating lines ~~communicate with~~to each of the first plurality of disk drives via each of the first plurality of connecting parts ~~in usual~~when no failure has occurred, however communication is switched from some of the first plurality of communicating lines is ~~changed to~~ some of the second plurality of communicating lines when a failure ~~happen~~has occurred in some of the first plurality of communicating lines, and communication is performed from some of the second plurality of communicating lines ~~communicate with~~to some of the first plurality of disk drives via some of the first plurality of connecting parts.

6. (currently amended) A disk storage system according to claim 5, wherein communication is performed from each of the first plurality of communicating lines ~~communicate with~~to each of the first plurality of disk drives via each of the first

plurality of connecting part when no failure has occurred ~~in usual~~ however communication is switched from some of the first plurality of communicating lines is ~~changed to~~ some of the second plurality of communicating lines when a failure ~~happen~~ has occurred in the first loop, and communication is performed from some of the second plurality of communicating lines ~~communicate with~~ to some of the first plurality of disk drives via some of the first plurality of connecting parts.

7. (currently amended) A disk storage system according to claim 6, wherein each of the second plurality of communicating lines corresponding to the second plurality of disk drives are a normal communication route, and each of the first plurality of communicating lines corresponding to the second plurality of disk drives are communication route in case of a failure of each of the second plurality of communicating lines.

8. (currently amended) A disk storage system according to claim 7, wherein each of the second plurality of communicating lines corresponding to the second plurality of disk drives are a normal communication route, and each of the first plurality of communicating lines corresponding to the second plurality of disk drives are communication route in case of a failure of the second loop.

9. (currently amended) A disk storage system according to claim 8, wherein communication is performed from each of the second plurality of communicating lines ~~communicate with~~ to each of the second plurality of disk drives

via each of the second plurality of connecting parts when no failure has occurred in usual, however communication is switched from some of the second plurality of communicating lines ~~is changed to~~ some of the first plurality of communicating lines when a failure ~~happen~~ has occurred in some of the second plurality of communicating lines, and communication is performed from some of the first plurality of communicating lines ~~communicate with~~ to some of the second plurality of disk drives via some of the second plurality of connecting parts.

10. (currently amended) A disk storage system according to claim 9, wherein communication is performed from each of the second plurality of communicating lines ~~communicate with~~ to each of the second plurality of disk drives via each of the second plurality of connecting parts when no failure has occurred in usual, however communication is switched from some of the second plurality of communicating lines ~~is changed to~~ some of the first plurality of communicating lines when a failure ~~happen~~ has occurred in the second loop, and communication is performed from some of the first plurality of communicating lines ~~communicate with~~ to some of the second plurality of disk drives via some of the second plurality of connecting parts.

11. (original) A disk storage system according to claim 1, wherein some of the first plurality of connecting parts connect one of the first plurality of communicating lines, and some of the second plurality of connecting parts connect one of the second plurality of communicating lines.

12. (currently amended) A disk storage system according to claim 11, wherein each of the first plurality of communicating lines corresponding to the first plurality of disk drives are a normal communication route, and each of the second plurality of communicating lines corresponding to the first plurality of disk drives are communication route in case of a failure of each of the first plurality of communicating lines.

13. (currently amended) A disk storage system according to claim 12, wherein each of the first plurality of communicating lines corresponding to the first plurality of disk drives are a normal communication route, and each of the second plurality of communicating lines corresponding to the first plurality of disk drives are communication route in case of a failure of the first loop.

14. (currently amended) A disk storage system according to claim 13, wherein communication is performed from each of the first plurality of communicating lines ~~communicate with~~ to each of the first plurality of disk drives via each of the first plurality of connecting parts when no failure has occurred ~~in usual~~, however communication is switched from some of the first plurality of communicating lines is ~~changed to~~ some of the second plurality of communicating lines when a failure ~~happen~~ has occurred in some of the first plurality of communicating lines, and communication is performed from some of the second plurality of communicating

lines ~~communicate with~~to some of the first plurality of disk drives via some of the first plurality of connecting parts.

15. (currently amended)A disk storage system according to claim 14, wherein communication is performed from each of the first plurality of communicating lines ~~communicate with~~to each of the first plurality of disk drives via each of the first plurality of connecting parts when no failure has occurred~~in usual~~, however communication is switched some of the first plurality of communicating lines is ~~changed to~~ some of the second plurality of communicating lines when a failure ~~happen~~has occurred in the first loop, and communication is performed from some of the second plurality of communicating lines ~~communicate with~~to some of the first plurality of disk drives via some of the first plurality of connecting parts.

16. (currently amended)A disk storage system according to claim 15, wherein each of the second plurality of communicating lines corresponding to the second plurality of disk drives are a normal communication route, and each of the first plurality of communicating lines corresponding to the second plurality of disk drives are communication route in case of a failure of each of the second plurality of communicating lines.

17. (currently amended)A disk storage system according to claim 16, wherein each of the second plurality of communicating lines corresponding to the second plurality of disk drives are a normal communication route, and each of the

first plurality of communicating lines corresponding to the second plurality of disk drives are communication route in case of a failure of the second loop.

18. (currently amended) A disk storage system according to claim 17, wherein communication is performed from each of the second plurality of communicating lines ~~communicate with~~ to each of the second plurality of disk drives via each of the second plurality of connecting parts when no failure has occurred in usual, however communication is switched from some of the second plurality of communicating lines ~~is changed to some of the first plurality of communicating lines~~ when a failure ~~happen~~ has occurred in some of the second plurality of communicating lines, and communication is performed from some of the first plurality of communicating lines ~~communicate with~~ to some of the second plurality of disk drives via some of the second plurality of connecting parts.

19. (currently amended) A disk storage system according to claim 18, wherein communication is performed from each of the second plurality of communicating lines ~~communicate with~~ to each of the second plurality of disk drives via each of the second plurality of connecting parts when no failure has occurred in usual, however communication is switched from some of the second plurality of communicating lines ~~is changed to some of the first plurality of communicating lines~~ when a failure ~~happen~~ has occurred in the second loop, and communication is performed from some of the first plurality of communicating lines ~~communicate with~~

to some of the second plurality of disk drives via some of the second plurality of connecting parts.

20. (currently amended) A disk storage system according to claim 1, wherein the first plurality of communicating lines corresponding to the first plurality of disk drives are a normal communication route, and some of the second plurality of communicating lines corresponding to some of the first plurality of disk drives are communication route in case of a failure of some of the first plurality of communicating lines.

21. (currently amended) disk storage system according to claim 20, wherein the second plurality of communicating lines corresponding to the second plurality of disk drives are a normal communication route, and some of the first plurality of communicating lines corresponding to some of the second plurality of disk drives are communication route in case of a failure of some of the second plurality of communicating lines.

22. (currently amended) A disk storage system according to claim 1, wherein the first plurality of communicating lines corresponding to the first plurality of disk drives are a normal communication route, and the second plurality of communicating lines corresponding to the first plurality of disk drives are communication route in case of a failure of the first loop.

23. (currently amended) A disk storage system according to claim 22, wherein the second plurality of communicating lines corresponding to the second plurality of disk drives are a normal communication route, and the first plurality of communicating lines corresponding to the second plurality of disk drives are communication route in case of a failure of the second loop.

24. (currently amended) A disk storage system according to claim 1, wherein communication is performed from the first plurality of communicating lines ~~communicate with~~to the first plurality of disk drives via the first plurality of connecting parts when no failure has occurred~~in usual~~, however communication is switched from some of the first plurality of communicating lines ~~is changed to~~ some of the second plurality of communicating lines when a failure ~~happen~~has occurred in some of the first plurality of communicating lines, and communication is performed from some of the second plurality of communicating lines ~~communicate with~~to some of the first plurality of disk drives via some of the first plurality of connecting parts.

25. (currently amended) A disk storage system according to claim 24, wherein communication is performed from the second plurality of communicating lines ~~communicate with~~to the second plurality of disk drives via the second plurality of connecting parts when no failure has occurred~~in usual~~, however communication is switched from some of the second plurality of communicating lines ~~is changed to~~ some of the first plurality of communicating lines when a failure ~~happen~~has occurred in some of the second plurality of communicating lines, and communication is

performed from some of the first plurality of communicating lines ~~communicate with~~to some of the second plurality of communicating lines communicate with some of the second plurality of disk drives via some of the second plurality of connecting parts.

26. (currently amended) A disk storage system according to claim 1, wherein communication is performed from the first plurality of communicating lines ~~communicate with~~to the first plurality of disk drives via the first plurality of connecting parts when no failure has occurred~~in usual~~, however communication is switched from the first plurality of communicating lines ~~is changed to~~ the second plurality of communicating lines when a failure ~~happen~~has occurred in the first loop, and communication is performed from the second plurality of communicating lines ~~communicate with~~to the first plurality of disk drives via the first plurality of connecting parts.

27. (currently amended) A disk storage system according to claim 26, wherein communication is performed from the second plurality of communicating lines ~~communicate with~~to the second plurality of disk drives via the second plurality of connecting parts when no failure has occurred~~in usual~~, however communication is switched from the second plurality of communicating lines ~~is changed to~~ the first plurality of communicating lines when a failure ~~happen~~has occurred in the second loop, and communication is performed from the first plurality of communicating lines ~~communicate with~~to the second plurality of disk drives via the second plurality of connecting parts.